



Applying our
automotive intellect to
design products
that help customers
build vehicles that
appeal to drivers and
passengers around
the world

Visteon GENIVI presentation



Agenda

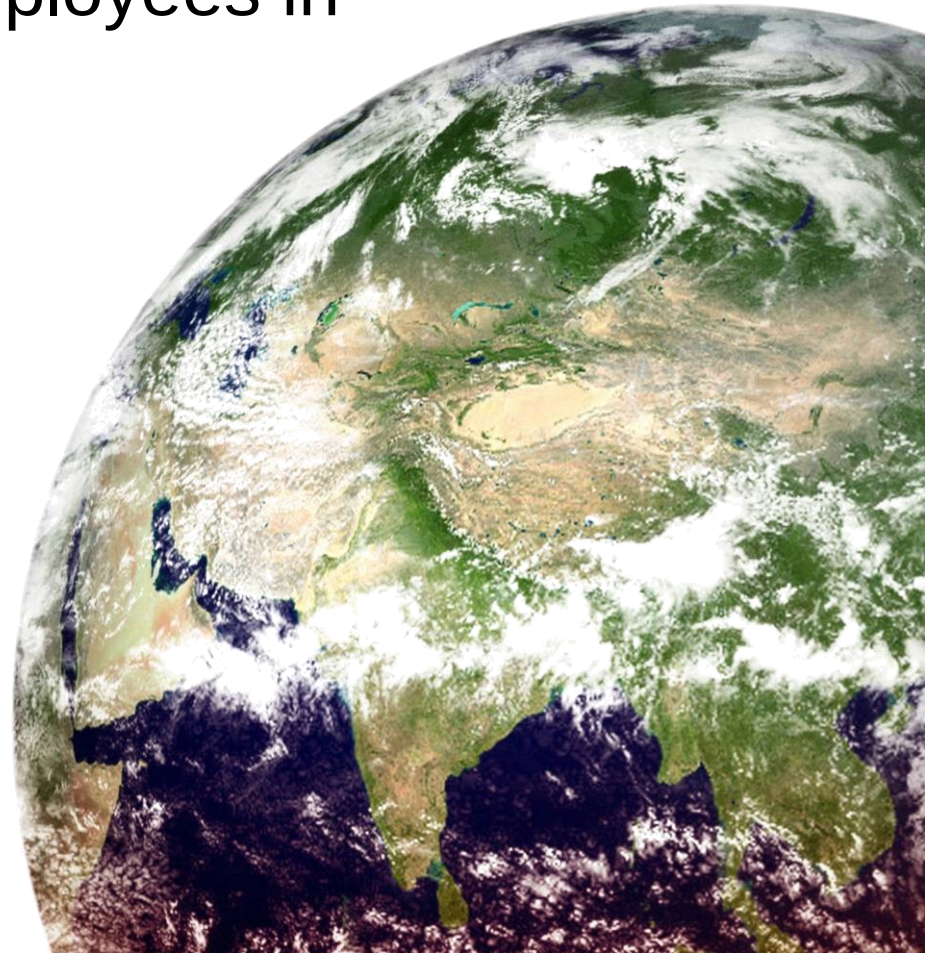


- Visteon overview
- Traditional IVI approach & related problems
- Our approach: “Visteon Infotainment Platform”
- GENIVI overview
- Architecture
- Benefits
- Future challenges

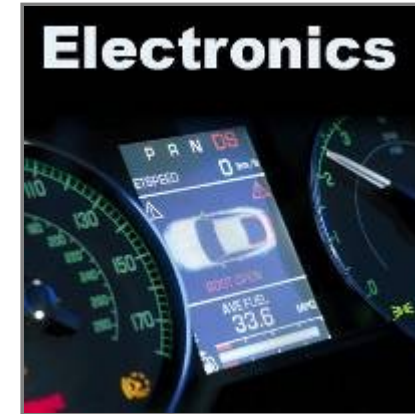
Visteon Today



- Leading global automotive supplier
- Approximately 30,000 employees in 26 countries
- Serving the world's major automakers
- Strong product portfolio:
 - Climate
 - Interiors
 - Electronics
 - Lighting



Product Overview



- Engine Induction
- HVAC Systems
- Powertrain Cooling
- Compressors
- Fluid Transport
- Cockpit Modules
- Instrument Panels
- Consoles
- Door Trim
- Audio and Infotainment
- Instrumentation and Displays
- Powertrain and Feature Controls
- Control Panels
- Front/Rear Lighting

Global Technical Capabilities



The Americas



Visteon Corporate Offices and Innovation Center, U.S.
(Van Buren Township, Mich.)



Mexico Technical Center
(Chihuahua)



Arbor Technical Center
(São Paulo, Brazil)

Asia



Asia Pacific Corporate Office and Innovation Center
(Shanghai, China)



Visteon Technical and Services Center
(Chennai, India)

Europe



European Corporate Office and UK Innovation Center
(Chelmsford, UK)



Kerpen Customer and Technical Center
(Kerpen, Germany)



Harnes Technical Center
(Harnes, France)



Autopal Technical Center
(Novy Jicin, Czech Republic)



Visteon Software Technologies (Office)
Sophia Antipolis, France)

Infotainment Market View



- **Economic challenges** - Need to be solved
 - Shorter vehicle lifecycles
 - Reduce R&D
 - Reduce total system costs and complexity
 - Reduce feature obsolescence
 - Ever increasing feature content driven by faster CE market



- **New feature** - Key market drivers
 - Internet & LBS
 - Off-board services
 - Graphics
 - Upgrades
 - Always connected
 - Low power
 - The influence of the CE world

Future infotainment architectures need to be flexible, upgradeable, fast to implement and cost efficient

The Visteon Approach



ARM

- Utilise high power micros in an integrated head unit



Microsoft
Silverlight



- Radically Simplified HMI development/implementation process



- Enable solutions for unhindered Internet Connectivity for Driver and Passengers

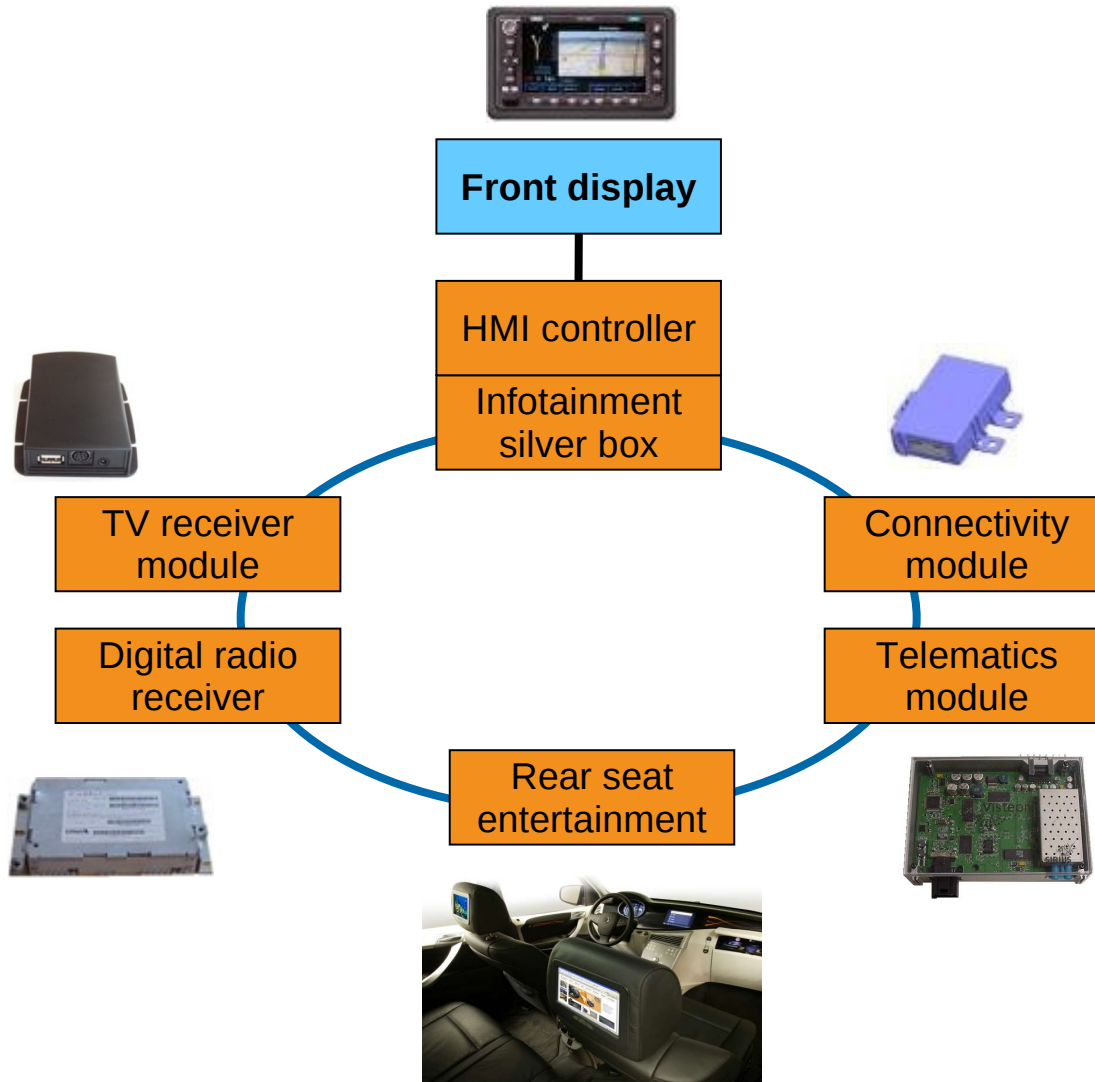


- Provide seamless user-experience between both onboard and off board features and functions



- Significantly reduced R&D and time to market

Today's Systems

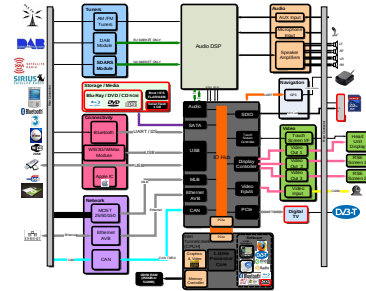


- Multiple separate modules
- Multiple display drivers and graphics
- Multiple separate HMI instances
- Complex media bus

The Future: Visteon Infotainment Platform VIP



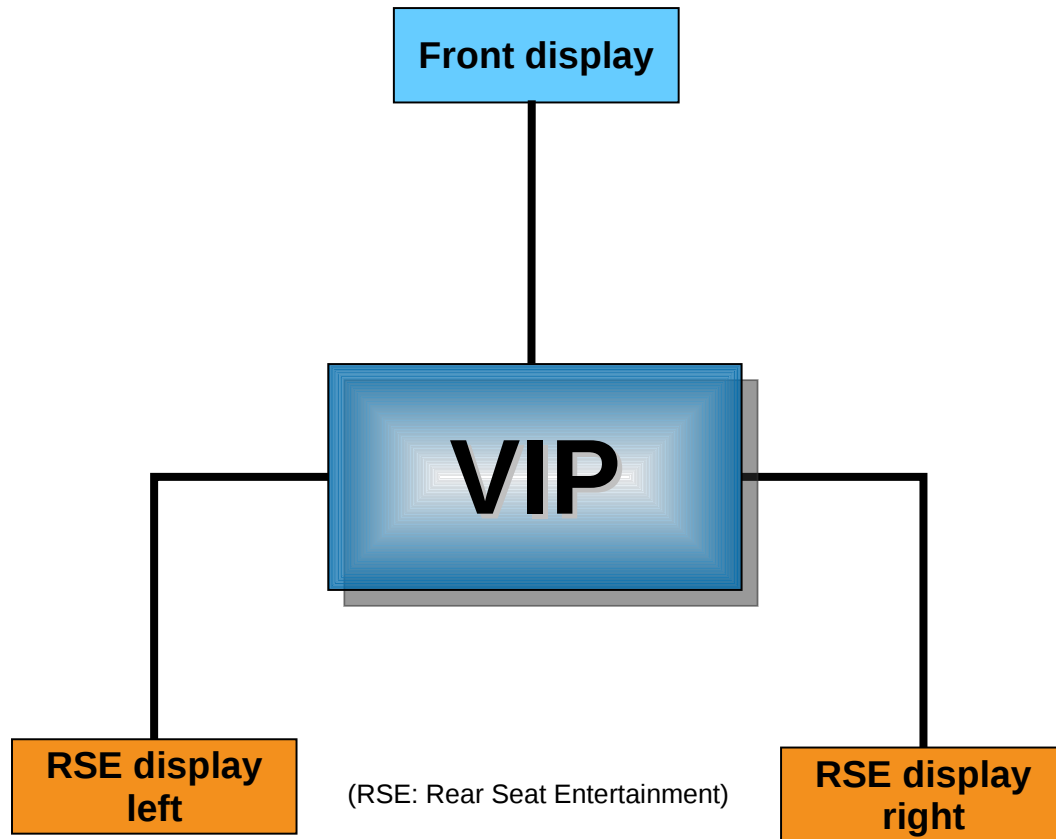
- The VIP is a scalable platform which:-
 - Runs multiple infotainment features concurrently (audio & navigation head unit, RSE, media player, connectivity)
 - Reducing system complexity and cost
 - Provides a harmonised control, graphic and HMI interface simplifying usability
 - Uses open source code (GENIVI Linux) re-using a core set of standardised features shared with the automotive community – reducing development cost and time to market
 - Supports feature upgrades reducing near term software redundancy and ensuring HMI updates as feature updates
 - Is a pre – developed, tested and validated platform, allowing the customer to focus on features that will differentiation their brand
 - Provides the foundation for a powerful automotive internet portal, providing access to new services that customers want and new OEM revenue streams



✓ True convergence of Infotainment Devices



Visteon Infotainment Platform VIP



- Less boxes
- No media bus
- Better feature integration
- Low cost per high-end feature
- More information and entertainment
- Integrated & multiple HMI instances same logic



True convergence of Infotainment Devices



VIP: Linking HW, SW & WWW



✓ A platform without content is nothing



VIP: WYSIWYG – HMI

(What You See Is What You Get)



HMI definition, development and implementation on multifunction complex infotainment systems is a significant part of the development cost and time for vehicle manufacturers

- The Visteon Infotainment Platform provides HMI interface tool chain that will also:-
 - Significantly reduces the time to market
 - Eliminate laborious specifications for graphical templates, animation descriptions, etc.
 - The HMI can be tested on a state-machine simulations independent of hardware



✓ Content is not useable without a HMI



The Importance of GENIVI?



- **Virtually eliminate the perpetual replication of non-value add R&D**
Network, diagnostics, MOST drivers, CAN stack, USB, ...etc are developed again and again, by each supplier, for each car maker, for every embedded device
- **Reduce R&D cost, quantity of engineers, and time to market**
Projects start with an already established and comprehensive SW library from day 1
- **Significant reduction in the burden of inter-supplier communication**
Tier 1's can avoid typical protracted negotiations and delays sharing system data
- **Open source model drives cumulative improvements**
Each community project adds and builds upon the previous. The enhancements, bug fixes and performance patches get re-deposited in open source library for free adoption)

"Currently OEMs will define their requirements in varying degrees of detail and the first tier will develop and deliver to that specification. It is a highly integrated vertical model, which means each 1st tier has its own implementation, if I buy two similar spec head units from two suppliers the implementation that has been used is completely different from one supplier to the next. There is a common objective to get to the point, where there is a platform or number of platforms available to the automotive industry, upon which they can differentiate and build their products. The major difference lies in the approach to achieve that, what GENIVI set out to do is deliver a solution that does not have a single point dependency in the whole of the solution stack."

Graham Smethurst, President of GENIVI & Product Manager at BMW

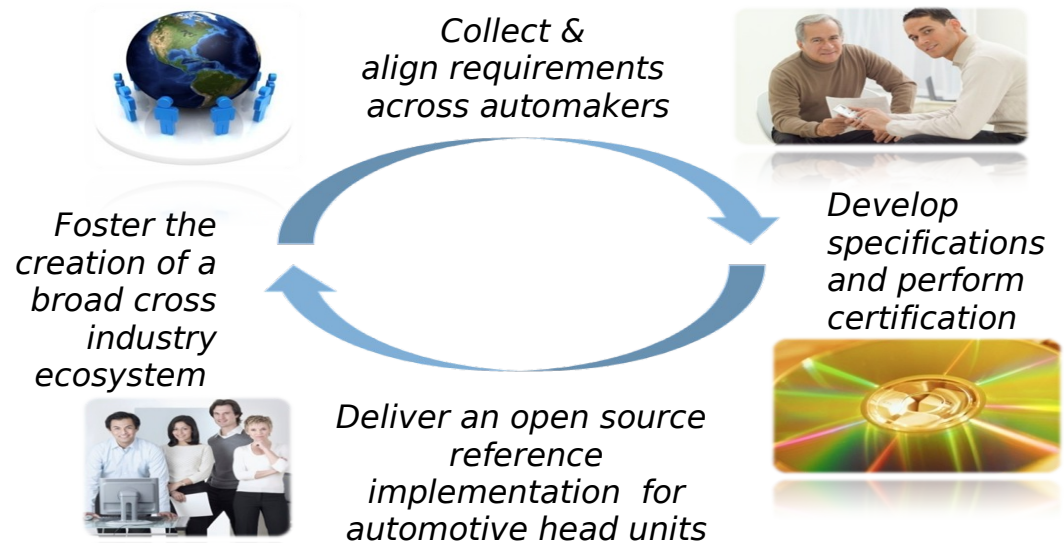


✓ **GENIVI is the solution for future infotainment**

GENIVI: The Framework



- Not a standards organization
- Not an open source project
- A non-profit organization
- A proven collaboration model:



- OEM specific applications (e.g. HMI, network) do not need to be contributed to the open source

GENIVI: Involved Partners



Automaker



1st Tier



**OS
Middleware
Services**



Silicon



- **Independent entities:**
 - *Moblin is community driven*
 - *GENIVI is driven by the consortium to meet the needs of the automotive industry*

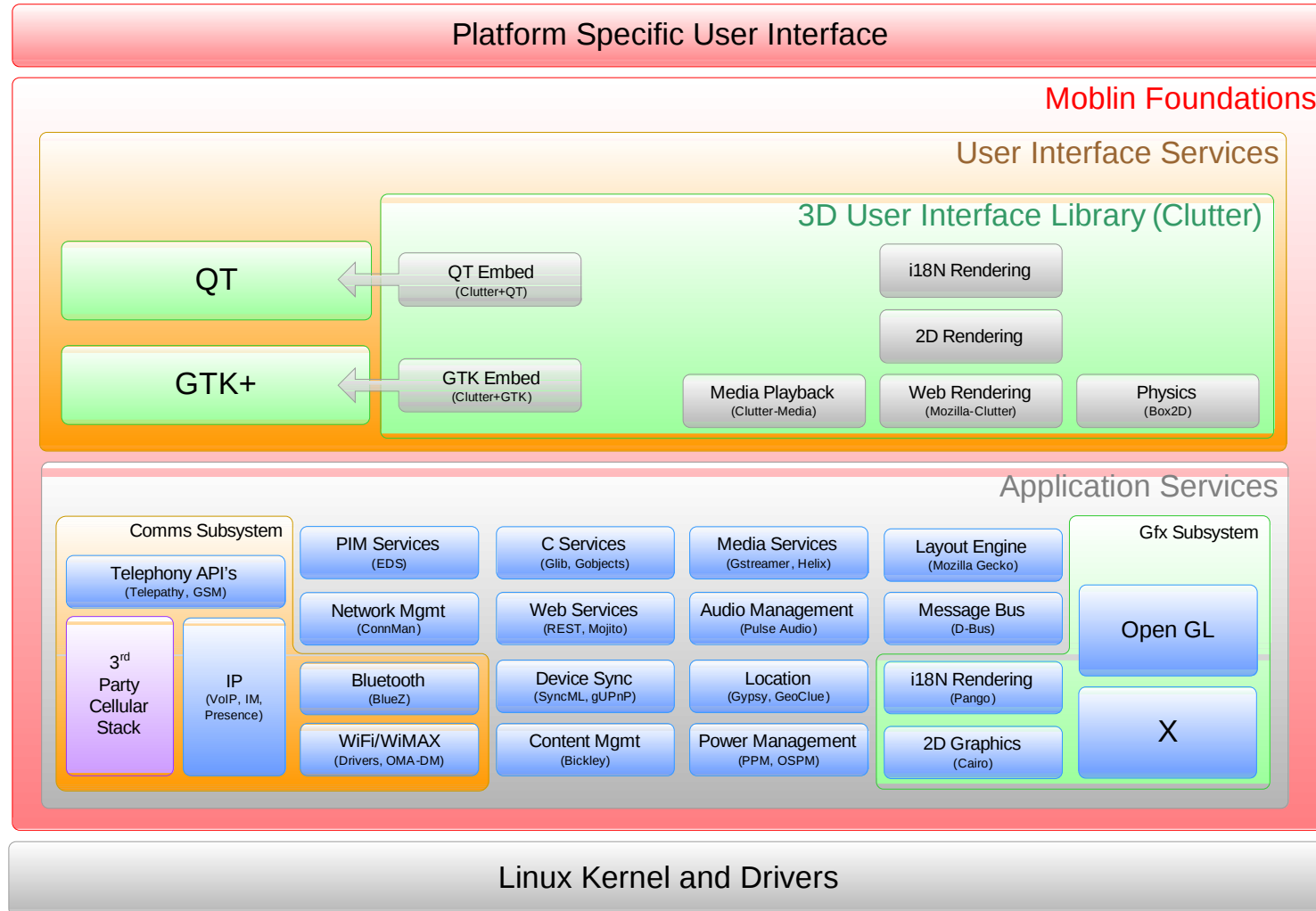
- **But aligned on objectives:**
 - *GENIVI uses Moblin as its primary baseline code base*
 - *Moblin uses GENIVI as its primary contributor for automotive components*
 - *Moblin IVI is a Linux distribution specifically targeted at In Vehicle Infotainment*

System Software Architecture: Foundation

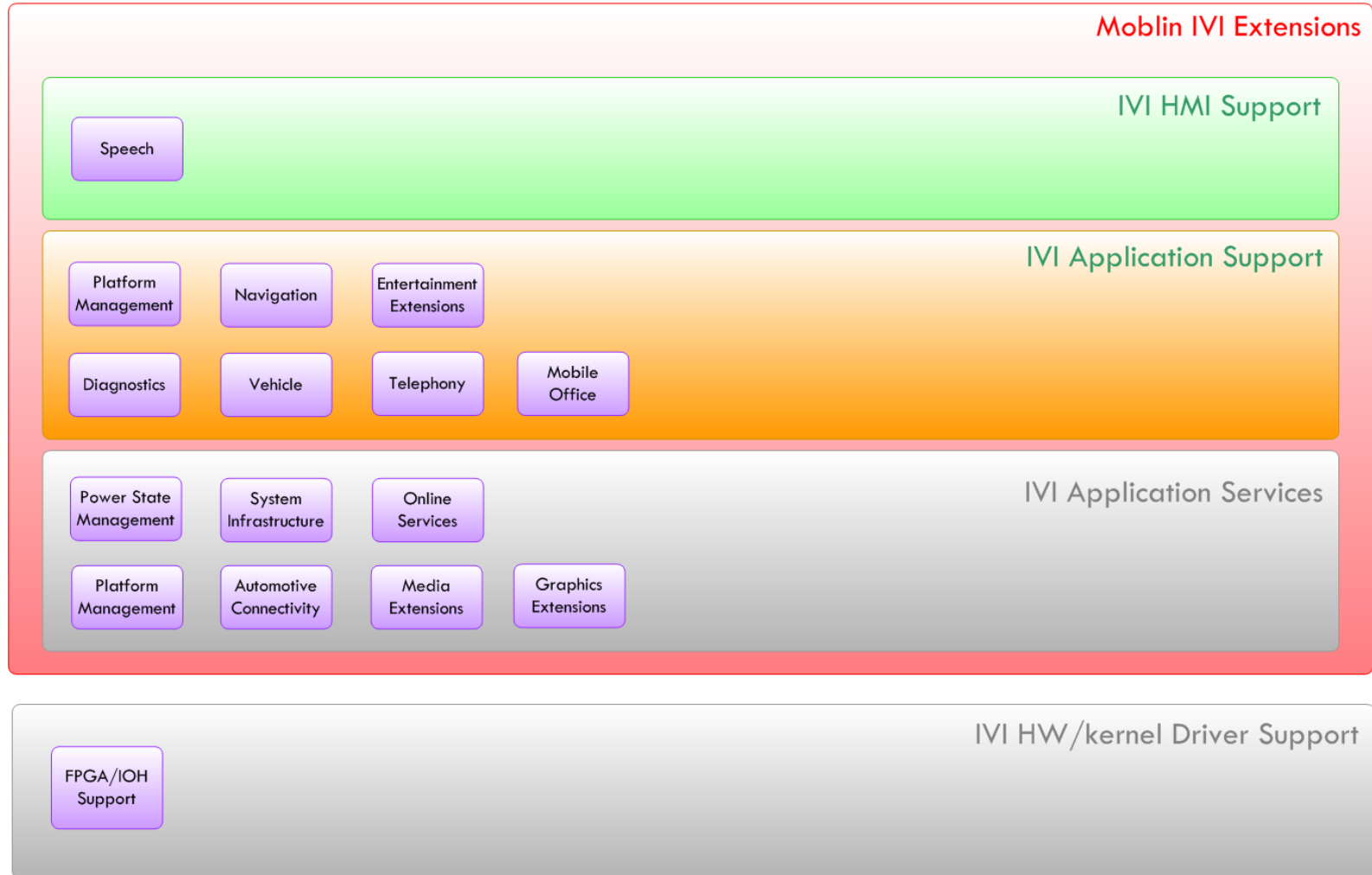


- **The Visteon Infotainment Platform Software is Based on the Following Subsystems:**
 - *IVI Linux Kernel (Currently 2.6.31-rc6)*
 - *Moblin 2.0 distribution*
 - *Moblin 2.0 IVI extensions (Currently Moblin IVI 0819 build)*
 - *GENIVI 1.0 application framework and system services*
 - *RAPID-specific HMI, application services and HW driver support*

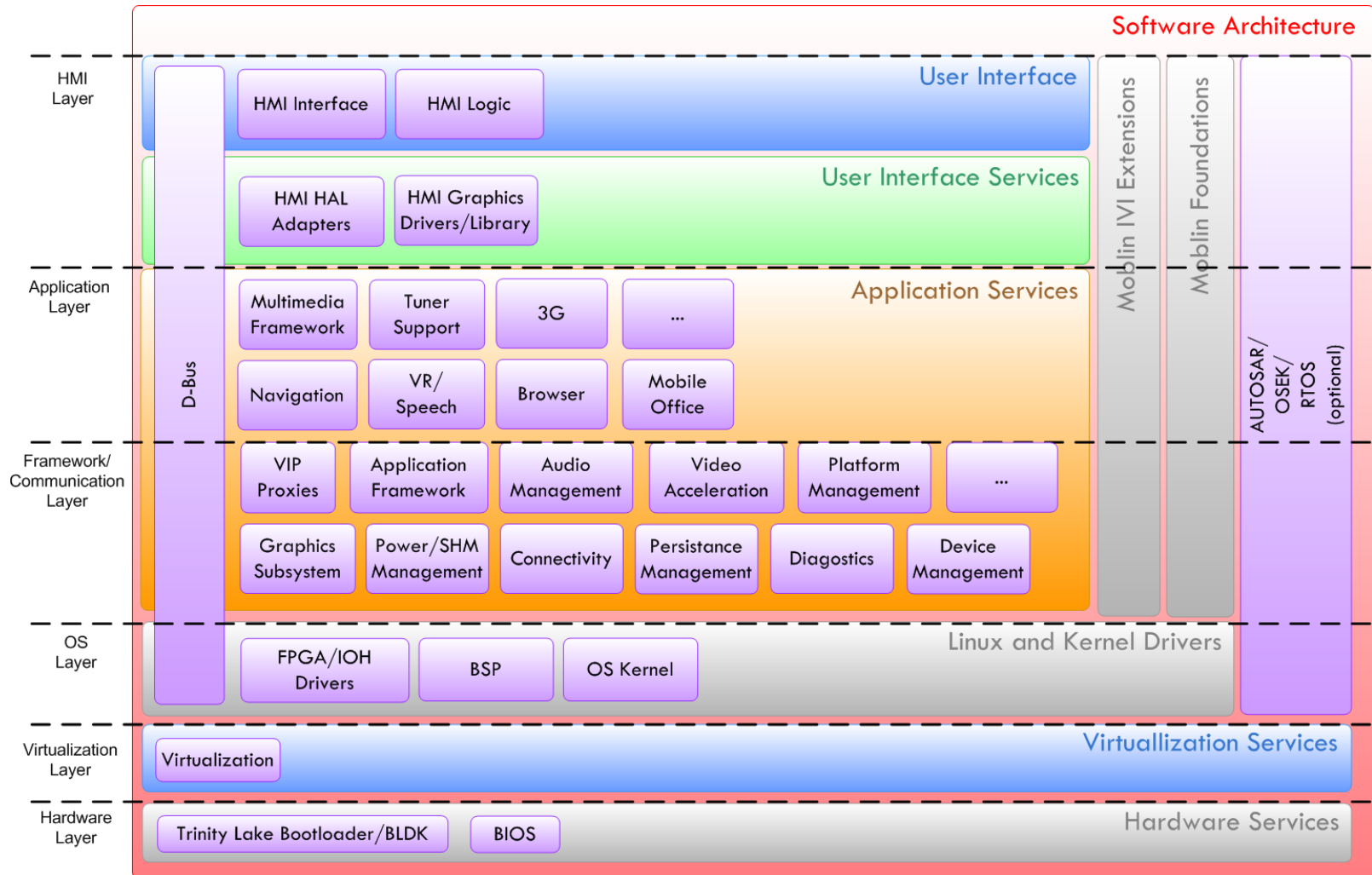
System Software Architecture: Moblin



System Software Architecture: Moblin IVI Extensions



System Software Architecture: VIP Architecture



Benefits of GENIVI & VIP



- **Reduced development cost**
- **Transparent software license cost**
- **Control over validation costs**
- **Promoting the convergence of Consumer Electronics and Automotive**
- **Using proven and standards-based open platforms to minimize risks**

- **Profile management**
 - *Access and Admin rights*
 - *Favourites*
 - *Profile & Image transfer*
- **Security**
 - *Personal, Car, Vehicle manufactures, Internet, Personal devices*
 - *Privacy*
- **Data control and Content protection**
 - *DRM*
 - *Volume of data*



www.visteon.com